2.4.6. Doppler Beam Sharpened Notch Width

2.4.6.1. Purpose

The purpose of this test is to determine the angular width of the DBS notch over the nose of the airplane and the effect that this notch has upon ingress and attack tactics.

2.4.6.2. General

The theory behind the DBS mode and the reason that the notch exists over the nose of the airplane is explained in the radar theory section. The notch is important since it limits the airplane from flying directly to the target while using the DBS mode. The effect that this has upon tactics depends on the width of the notch. For radars that fill the notch with real beam video, the break between the two is usually apparent and easily defined. The notch is still important is this case since the real beam filler does not have the resolution of the DBS picture and still requires maneuvering away from the direct inbound path to use the DBS mode on the target area. Typically, the notch is narrow enough that the DBS display can be centered on the nose of the airplane and the notch will be completely enclosed within the display with DBS video on either side, simplifying the measurement of the notch width.

2.4.6.3. Instrumentation

Data cards, a ruler and an optional voice recorder are required for this test.

2.4.6.4. Data Required

Record the angular width of the B scan format used for the test and mark on the edge of the data card both sides of the DBS display and both sides of the notch. During mission relatable ingresses and attacks, record qualitative comments on the effect that the notch has upon ingress tactics.

2.4.6.5. Procedure

With the airplane flying straight and level at a medium altitude, center the DBS display over the nose at approximately 20 to 30 nm and allow the display to build. Hold the data card up to the display, perpendicular to the DBS notch. Mark on the card the left and right side of the display and the left and right side of the notch. Perform mission relatable ingresses and simulated attacks using the DBS mode. Record qualitative comments concerning the effects upon tactics of not being able to fly directly to the target.

2.4.6.6. Data Analysis and Presentation

Use the ruler to determine the distance between the two tick marks on the data card that represent the edges of the DBS display and the distance between the two tick marks that represent the edges of the notch. Use equation 20 to find the DBS notch width.

$$NOTCH_{deg} = \frac{(NOTCH_{in})(B \ scan \ deg)}{(B \ scan \ in)}$$

$NOTCH_{deg}$=angular width of the DBS notch
$NOTCH_{in}$=linear width of the DBS notch on the B scan display
B scan deg=angular width of the B scan display section
B scan in=linear width of the B scan display

(20)

Relate the width of the notch to the requirement to zigzag to the target to keep it out of the notch and to the requirement to eventually put the target in the notch and rely upon the target stored position just before over-flying the target.

2.4.6.7. Data Cards

A sample data card is provided as card 29.

CARD NUMBER ___   TIME ___   PRIORITY L/M/H

DBS NOTCH WIDTH

[CLIMB TO _____ FEET MSL.   SELECT DBS AND CENTER THE DBS MAP ON THE NOSE AT 20 TO

30 NM.   HOLD THE DATA CARD UP TO THE DBS DISPLAY, PERPENDICULAR TO THE NOTCH, AND

MARK THE EDGES OF THE DISPLAY AND OF THE NOTCH.]

DISPLAY ANGULAR WIDTH SELECTED _____

[RECORD QUALITATIVE COMMENTS CONCERNING THE EFFECTS OF THE NOTCH UPON MISSION

RELATABLE INGRESSES AND ATTACKS.]

EFFECTS:

Card 29: Doppler Beam Sharpened Notch Width Data Card